CLAIMS

What is claimed is:

1. A bicycle wheel rim, comprising an inner peripheral wall, an outer peripheral wall, two lateral walls joining said peripheral walls and two circumferential wings, for anchoring a tire, which extend outwards from the two sides of the outer peripheral wall, wherein said rim is made of a single part of structural fiber based material incorporating the two circumferential wings.

2. The rim of claim 1, wherein said structural fibers are selected among: carbon fibers, glass fibers, aramidic fibers, boron fibers, ceramic fibers, or any combinations thereof.

3. The rim of claim 1, wherein it has a symmetrical cross-section.

4. The rim of claim 1, wherein it has an asymmetrical cross-section.

5. The rim of claim 1, wherein it has a layered structure of fiber based fabric material, including at least first layers extending so as to contribute to define the inner wall, the lateral walls and the two wings of the rim and second layers arranged so as to contribute to define the inner, lateral and outer walls of the rim.

6. The rim of claim 5, wherein the layered structure further includes third layers arranged to define the outer wall and the two wings of the rim.

7. The rim of claim 6, wherein said layered structure further comprises fourth layers (D) wound in the side regions of the outer walls of the rim from which said wings depart.

8. A bicycle wheel rim, comprising an inner peripheral wall, an outer peripheral wall, two lateral walls joining said peripheral walls and two circumferential wings, for anchoring a tire, which extend outwards from the two sides of the outer peripheral wall, wherein said rim is made of a single part of structural fiber based material incorporating the two circumferential wings, and

wherein said structural fibers are selected among: carbon fibers, glass fibers, aramidic fibers, boron fibers, ceramic fibers, or any combinations thereof.

9. A bicycle wheel rim, comprising an inner peripheral wall, an outer peripheral wall, two lateral walls joining said peripheral walls and two circumferential wings, for anchoring a tire, which extend outwards from the two sides of the outer peripheral wall, wherein said rim is made of a single part of structural fiber based material incorporating the two circumferential wings, and

wherein the rim has a layered structure of fiber based fabric material, including at least first layers extending so as to contribute to define the inner wall, the lateral walls and the two wings of the rim and second layers arranged so as to contribute to define the inner, lateral and outer walls of the rim.

10. A bicycle wheel rim, comprising an inner peripheral wall, an outer peripheral wall, two lateral walls joining said peripheral walls and two circumferential wings, for anchoring a tire, which extend outwards from the two sides of the outer peripheral wall, wherein said rim is made of a single part of structural fiber based material incorporating the two circumferential wings,

wherein the rim has a layered structure of fiber based fabric material, including at least first layers extending so as to contribute to define the inner wall, the lateral walls and the two wings of the rim and second layers arranged so as to contribute to define the inner, lateral and outer walls of the rim, and

wherein the layered structure further includes third layers arranged to define the outer wall and the two wings of the rim.

11. A method for producing a bicycle wheel rim of the type presenting an inner peripheral wall, an outer peripheral wall, two lateral walls joining said peripheral walls, and two circumferential wings, for anchoring a tire, which extend outwards from the two sides of the outer peripheral wall,

wherein said method comprises the following steps:

a. applying on an inner part of a mold a predetermined number of layers of structural fiber fabric incorporated in a thermally activated material sufficient to form an inner wall, an outer wall, two lateral walls and wings;

b. arranging an inflatable bag on the layers between the lateral walls;

c. folding a first selected number of the predetermined layers on the inflatable bag, leaving the remaining predetermined number of layers free;

d. applying a core over the folded layers;

e. folding the remaining predetermined number of the layers over the core;

f. applying an outer part of the mold to enclose the layers;

g. inflating the inflatable bag to press the layers against the mold;

h. increasing the temperature of the mold to a value sufficient to activate the thermally activated material; and

i. removing the core and inflatable bag from the product of step h, to obtain a bicycle wheel rim formed of a single piece of structural fiber material.

12. The method of claim 11, wherein said core also applies pressure to said layers.

13. The method of claim 11, wherein the increase of temperature and application of pressure to the layers occur substantially simultaneously.

14. The method of claim 11, wherein a cooling phase is provided before removal of the rim from the mold.

15. The method of claim 11, wherein said core is made of a material with a thermal dilation coefficient exceeding 5 x 10 mm/°C, the molding process comprising an increase in temperature to a value sufficient to cause the material of said core to dilate so to press the layers of fabric forming the tire anchoring wings against the wall of the mold.

16. The method of claim 15, wherein the material forming the core has a thermal dilation coefficient exceeding 9x10 mm/0C.

17. The method of claim 16, wherein the material forming the core is either PTFE, or PCTFE, or PVDF, or PE-HD.

18. The method of claim 16, wherein the material forming the core is PTFE.

19. The method of claim 11, wherein said structural fibers are carbon fibers.

20. The method of claim 11, wherein said thermally activated material is a thermosetting plastic material matrix.

21. The method of claim 11, wherein said temperature is comprised in the range from 80°C to 200°C.

22. The method of claim 21, wherein said temperature is maintained for 10 minutes to 3 hours.

23. The method of claim 22, wherein said temperature is maintained for 30 minutes to 3 hours.

24. The method of claim 11, wherein the core comprises two ring-shaped cores, which are arranged so as to be spaced from each other.

25. The method of claim 24, wherein each ring-shaped core is made in a single piece of deformable material.

26. The method of claim 24, wherein each ring-shaped core is split into several sectors.

27. The method of claim 24, wherein the space between said ring-shaped cores is filled by a circumferential rib belonging to the mold.

28. The method of claim 24, wherein a third ring-shaped core, also made of thermally dilating material, is arranged between said two rings.

29. The method of claim 28, wherein said third ring-shaped core is made in a single piece of deformable material.

30. The method of claim 28, wherein said third ring-shaped core is split into several sectors.

31. The method of claim 11, wherein the core is made by a single ring-shaped member of deformable dilating material.

32. The method of claim 31, wherein the core is made of a silicone sheath.

33. The method of claim 32, wherein the silicone sheath is divided in sectors.

34. The method of claim 33, wherein the single ring-shaped core has an outwardly facing recess for engagement of a centering projection of the mold.

35. The method of claim 34, wherein the centering projection is provided on an outer portion of the mold.

36. The method of claim 11 wherein the mold comprises two inner circumferential elements arranged side by side, on which the layers for forming the inner peripheral wall and the two lateral walls of the rim are deposited, said mold also comprising an outer circumferential element for pressing said layers which are to form the tire anchoring wings over said one or more cores.

37. The method of claim 11, wherein said structural fibers are selected among: carbon fibers, glass fibers, aramidic fibers, boron fibers, ceramic fibers, or any combinations thereof.

38. The method of claim 11, wherein said tire anchoring wings are firstly made during said molding process with a longer length than required and that after opening the mold said wings are reduced to the required length and/or shape by a machining operation.

39. The method of claim 11, wherein first additional layers are applied to increase the thickness of the outer wall and/or of the two wings of the rim.

40. The method of claim 39, wherein second additional layers are applied to fill the side regions of the outer wall of the rim from which said wings depart.

41. The method of claim 11, wherein said mold and said cores are arranged to define a rim with a symmetrical cross-section.

42. The method of claim 11, wherein said mold and said cores are arranged to define a rim with an asymmetrical cross-section.